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Massage In Traumatic Sciatica.*

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Surgeon Rock Island Lines.

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MASSAGE IN TRAUMATIC SCIATICA.*

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The term "sciatica" has been applied to neuralgia, perineuritis and neuritis affecting the sciatic nerve or its branches. While this terminology is asserted to be indefinite and confusing from the neurologists's point of view, I believe it is very practical clinically to use as a cognomen for this conflux of ailments, as neuralgia, perineuritis and neuritis often occur together, and one or the other cannot always be excluded.

The etiology of sciatica is very extensive, but in this paper the discussion will be limited to trauma as a causative factor.

Neuritis and neuralgia are very rare as primary conditions and are nearly, if not always, secondary to perineuritis or due to reflex and may appear as a manifestation of systemic conditions.

The sciatic nerve may be affected by trauma directly or indirectly. In direct injury to the nerve, the structures in proximity to the injured parts are also implicated by the same force. During the late wars the sciatic nerve was directly injured by gunshot more frequently than in former times. This is believed to be due to the high velocity and small caliber of the modern rifles.

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Other causes of direct injury to the nerve are: External compression, contusion, lacerated, incised and punctured wounds. The back of the thigh, pressed against the edge of a hard seat will invariably give rise to sciatica. Hence locomotive engineers often suffer from this cause. I have also seen sciatica induced from a suspensory drawn too tightly in the gluteal fold, I recollect one instance of a man who complained of his feet going to sleep all the time, and found that he had the habit of resting his legs on the edge of his desk, which was indicated by a deep indentation transversely in the middle third of each calf. In fractures and fracture-dislocations the nerve may be torn, lacerated or compressed.

The indirect injuries to the sciatic nerve occur as sequelæ in fractures and fracture-dislocations in the lumbar region of the spinal column, in the pelvis or the lower extremity, or from contusions along the course of the nerve. In such cases displaced bones, splinters or pent-up effusions may exert such pressure as to limit or inhibit function, or the inflammation may involve it by continuity, either from proximate structures or through the spinal cord, cauda equina or connected nerves by ascending or descending degeneration.

After fractures the callus formation may gradually involve the nerve or it may be caught in cicatrices or strangulated by contracting fascia. The sequelæ of traumatic myositis, *i. e.* indurations, may exert irritating pressure upon the

nerve. A too-tightly applied splint, cast or bandage may injure the nerve in cases where it was not affected by the original trauma. The lesion in the nerve is generally local, but may extend to connected branches; it may be irritative or destructive.

The symptoms of injury of the sciatic nerve are motor, sensory and trophic; either or all may be present independent of the others. If any one or two of these symptoms are absent, or present only in a mild form, it is evidence that the nerve is not totally severed.

The motor symptoms are most important, particularly if total immobility is present. If a muscle contracts ever so faintly when percussion is applied to its motor point, there are still active motor fibres in the nerve which supplies the muscle thus tested. Another method more well known, is the "electric-reaction test," by which the degeneration in muscles can be measured. The muscles react in degeneration of their motor nerves, later for percussion than for electricity, and in regeneration of the nerve the muscles react earlier to percussion than to electricity. As muscular contractility will vary in different individuals, a comprehension of the change may be had by comparing both sides of the body.

The sensory symptoms are of three distinct varieties. The epicritic sense conveys the sensation of—and localizes faint touch as with a feather, also delicate thermic changes. The protopathic sense conveys the sensation of cutan-

eous pain, conveys only senses of touch strong enough to depress the cuticle, requires a wider surface to differentiate and locate simultaneous multiple contact, and conveys sensation of greater thermic changes only. The deep sense conveys sense of weight and resistance, also of orientation of position and movement. Either of these varieties of sensation may be absent or present independent of the other, as each are conducted along different nerve fibres. The trophic disturbance, evidenced by atrophy or defect in nutrition may occur in a smaller degree in the muscles from non-use or pressure upon the same, which should not be mistaken for trophic paralysis.

The greater part of the sciatic nerve and its branches, both popliteal, anterior and posterior tibial, external and internal, plantar can be palpated under normal conditions. When irritated or inflamed, the nerve trunk is enlarged in diameter, tense, and at certain points (also where branches are given off) may be felt distinct rounded nodules "puncta dolorosa" or "Valleix's points." In paralysis the nerve is soft, smaller in diameter, more difficult to locate in palpation.

Prognosis depends on the degree and extent of the injury, on the age and the constitution of the patient, which is of more importance, as the injury is severe.

If the sciatic nerve or one of its larger branches is totally divided, the central fragment must be approximated and fixed to the distal,

before cicatrization interferes with the union. Where the division is only partial and no local pressure or sepsis is present, the regeneration depends entirely on the status of circulation and metabolism in the patient. We must not forget that when an axis cylinder is divided the distal fragment must degenerate, and the axon extend by regeneration from the proximal part. This neurogenesis takes place in the neurilemma of the distal section. Hence the importance of apposition. Consequently, the time required for recovery is in ratio to the length of the distal fragment, other conditions being equal. But the injured epineurium or neurilemma depend entirely upon the local circulation, absorption and metabolism for repair. And there is no other means known to stimulate these so favorably as massage.

A distinction must be made between a division of the axons and the arrest of their conducting power which may be due to pressure or irritation, either originating inside the sheath, from the sheath itself or from causes external to the nerve. A contusion may produce as much damage to the distal parts of a nerve, although not dividing it, as if the nerve was actually divided. But if the force is not too violent or persistent, the axons distal to the injury may not degenerate and function be restored in shorter time.

In a divided nerve the protopathic and deep sensory fibres regenerate first, motor and trophic slower, and epicritic last, in about two years.

Any complication to the injury, as well as morbid systemic conditions will delay and may prevent recovery. The disturbance due to pressure, without destructive action on the nerve, will soon disappear without further treatment when the cause is removed, but if the pressure is too long continued or too severe, a hyperplasia will be generated which continues to irritate the nerve after the pressure is removed, unless the new-formed tissue is absorbed.

The indications for treatment are to approximate and suture any severed nerves at once if possible; other injuries should be corrected, asepsis instituted and maintained in case of open wounds, all causes for internal and external pressure removed. The systemic condition should be improved as much as possible. Local massage is indicated as soon as conditions in the case will permit. The contraindications for massage are: Infection, unreduced fractures and dislocations, if recent, aneurism and unorganized thrombus. The danger of unhealed wounds and fractures can be circumvented by precautions as to asepsis and apposition.

Massage would be effectual in improving the local circulation of blood and lymph, promote interstitial absorption, stimulate cellular activity and metabolism. In serious injury to the nerve it would counteract the atrophy of the muscles to a certain extent. Deformities would be prevented by this means since the contractures due to unaffected opponent muscles would not occur. In fractures local massage should be

commenced if possible, before callus is formed in all cases where a nerve is involved in the injury, even if the nerve is not injured, as this treatment, if commenced early enough, will check formation of adhesions.

Even in advanced cases massage is of greatest value, either systemic to recompense for lack of activity, or locally to reduce deformities due to contractures, local adhesions, stimulate the local circulation, reduce the indurations following myositis, establish retrogressive metamorphosis in excessive encroaching callus, thus reducing cause for pressure and promoting restoration.

When motor power is restored the patient should be encouraged to use the injured parts and, by means of regulated repeated active and passive movements should be taught how to transmute his volition into definite voluntary movements.

The technic of massage in sciatica is simple, but judgment based on knowledge and understanding of the pathology and anatomy in the case is necessary for the operator. Contraindications must be observed.

In acute or recent cases the treatment should be sedative. In cases of old standing, where there is hyperplasia of connective tissue, it should be decidedly stimulating.

A massage treatment for sciatica should commence with centripetal stroking with the palm of one or both hands and palmar sur-

face of all the fingers applied so as to conform to the surface which is manipulated.

The pressure at first is very light, but as the hyperesthesia is reduced the pressure is gradually increased so the deeper veins and lymphatics are influenced by these manipulations. *Petrolatum molle* may be used to prevent chafing of the skin. This manipulation is the most effective known—interstitial absorptive.

After this the muscles in the region should be thoroughly kneaded. They are lifted up and rolled between the fingers and thumb as one would roll a marble, or they are compressed between the fingers and the underlying bone and rolled in the same way.

In a sedative treatment this is done very gently; in a stimulating, very vigorously; in both, all parts of the involved muscles are worked in this way. This is followed by some more of the centripetal strokings as before and then we can palpate the nerve through the relaxed muscles. The nerve is given frictions against the bone, small rotary movements, often with great pressure with the tips of one or two fingers or with the thumb. The course of the nerve is followed, any “puncta dolorosa” present noted and given special attention. After this some more strokings and—in a stimulating treatment only—the muscles are beaten with the loosely closed fist, with the finger tips, or with the ulnar margin of both hands alternately and transverse to the longitudinal axis of the muscles.

The patient who was placed in the prone or semiprone position, now changes to the dorsal and, if not contraindicated, the nerve should be stretched. The thigh is flexed strongly on the abdomen, the knee pointing to the opposite axilla, with one hand supporting the front of the knee the other placed back of the heel the leg is now extended as far as the patient can endure. I have yet to see the first case of sciatica, traumatic or not, which failed to recover under this treatment if judiciously carried out.

Through the courtesy of Dr. S. C. Plummer I am enabled to report these cases:

Case 1: Mr. B. was injured on Dec. 7, 1909. I saw him on Dec. 18, when he complained of pain in back and when he walked, also in testes. On examination I found effusion and tenderness in the lumbo-sacral region, most marked over the left ilio-lumbar and lumbo-sacral ligaments, which I believed were strained. On Dec. 20 the whole right lower limb was numb. He had local massage daily, with a few exceptions, until Jan. 26 (27 treatments). Called again on March 1, complaining of pain and weakness in the back, right leg and foot; was more marked when he was active and out in the cold. I suspected pressure on the sciatic nerve and located in the gluteal muscles some indurations which I believed to be sequelæ of a myositis, from the recent injury. The indurations were reduced by friction. He called on March 12; had been free of pain until then; was given another treatment. May 23 he called again, but this time there was

pain along the left sciatic nerve. The nerve was enlarged and hyperesthetic. He recovered from this attack after 7 massage treatments.

Case 2: Mr. M. fractured tibia and fibula in upper third of right leg on Sept. 24, 1909. On examination, March 3, 1910, I noted: The right leg flexed at the knee to right ankle, movement of knee very limited. Quadriceps atrophied, patella drawn up to upper part of lower third of thigh. The tibial tubercle enormously enlarged. All muscles below knee paralyzed, all joints below knee ankylosed. Some mobility at the seat of fracture. There was no sensation below middle of leg, except a deep dull ache. In superior third the protopathic sensation was present. The fracture is a simple one and the skia-graph shows it to be impacted, comminuted, complete, it is complicated by injury to both popliteal nerves. Besides, the patient sustained a fracture of the surgical neck of the right humerus with subglenoid dislocation at the same accident, due to which the right shoulder was ankylosed at the time of examination. He has had daily massage since March 3. At present there is free movement of shoulder and of knee, sensation present, all muscles react to percussion. Ankylosis yet remains in the ankle and metatarso-phalangeal articulations. In this case I am expecting full recovery, but it will still require some time.

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DISCUSSION.

Dr. H. B. Hemenway, Evanston, Ill.: I do not claim to be an expert masseur; I do little

massage. I rise more particularly to ask a question. I notice that the essayist speaks of centrifugal stroking. In many of these cases there is a degree of edema, and it has, therefore, always been my plan to begin by the opposite mode, in order to reduce the swelling. I would like to have Dr. Engelbrectson explain the why of the centrifugal instead of the centripetal stroking at first.

Dr. Engelbrectson: The doctor misunderstood me; I said *centripetal* stroking.

The object of the centripetal strokings is simply to affect the superficial lymphatics and veins. The current in these goes towards the heart, consequently the strokings should also be centripetal, towards the heart. We do not in any manipulation affect the arteries directly. This is done by reducing the periphereal resistance. As the superficial vessels are emptied, through their connections with the deeper vessels, the current from these is partially directed to the superficial vessels on account of the lesser resistance, and in this way the pressure in the deeper vessels becomes reduced. The object of commencing treatment with stroking is to reduce the edema.

Dr. Fairbrother: I would like to know just what you do, in case of a stiff elbow for example, what do you mean by "stroking"?

Dr. Engelbrectson: I will be glad to explain this.

We always work upon the bare skin, never through the clothing. In the first place I place the limb in such a position that it is perfectly

relaxed, because if in an uncomfortable position the muscles are contracted, then we cannot get through the muscle. It must be relaxed, and any muscle will relax if it is in a comfortable position and the patient respires normally, barring presence of irritation. Relaxation being secured, we must not work so hard as to get reflex contractions. In all cases where the skin of the patient or my hands are moist, I put *petrolatum molle* on the hands to prevent chafing. I then rub like this (indicating), forming my hand to fit snugly the surface on which I work. If the injury be here (elbow), I always start in the shoulder by passive movements, these movements stimulating the shoulder muscles and improving the circulation in the arm. No matter how much I worked here (at elbow), if the circulation here (in arm at shoulder) is not good it would do no good. So I work it like this (indicating *effleurage*) between the hands.

Dr. Fairbrother: Does this hurt?

Dr. Engelbretson: With gentle treatment it does not hurt. The muscles are relaxed, and gentle treatment should not hurt. When we give more forcible treatment it hurts. But no matter how much it hurts, as soon as treatment ceases, the pain is over and the patient always feels better afterwards. The length of treatment depends on conditions. Sometimes in beginning treatment we get lameness from the treatment itself. We get pain from muscular exertion to which we are not accustomed, but when through we have good results.

